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CLINICAL REPORT

Unsuspected tracheal web inhibits endotracheal intubation: report of a case

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Abstract A 66-year-old woman was scheduled for resection of a recurrent brain astrocytoma. During anesthesia induction, endotracheal intubation became impossible. Urgent bronchoscopy under laryngeal mask ventilation visualized a subglottic web 1 cm below the vocal cords. After bronchoscopic ablation with argon plasma coagulation, the airway intubation was successful.

Keywords Tracheal web · Argon plasma coagulation · Laryngeal mask

Introduction

A tracheal web is a rare late complication in endotracheal intubation. Its presence often causes intubation difficulties. We report a case of an asymptomatic subglottic web that blocked endotracheal intubation during general anesthesia for neurosurgery.

Case report

A 66-year-old woman was scheduled for resection of a recurrent brain astrocytoma. The original brain surgery for the astrocytoma had been done under general anesthesia 20 years previously. One year previous to the present operation, the patient had undergone a month of mechanical ventilation as a result of an epileptic attack; endotracheal intubation and tracheostomy were performed at that time. Chest X-ray and respiratory function test before this present surgery showed no abnormal findings. The patient had no respiratory symptoms such as dyspnea or stridor.

On the patient's arrival at the operating room, electrocardiogram, blood pressure, heart rate, and oxygen saturation began to be monitored continuously. After preoxygenation, intravenous induction was accomplished with atropine 0.4 mg, propofol 80 mg, and rocuronium 25 mg. Easy mask ventilation was performed for 2 min. Direct laryngoscopy was accomplished; the laryngoscopic view was grade 1 according to the Cormack and Lehane classification. An initial attempt to pass a 7.0 mm cuffed endotracheal tube beyond the true vocal cords encountered resistance. Similar resistance occurred with endotracheal tube sizes of 6.5 and 6.0 mm. As a tracheal web was confirmed during direct laryngoscopy, two attending anesthesiologists consulted us. Flexible bronchoscopy during laryngeal mask ventilation revealed a tracheal web below the vocal cords (Fig. 1a). It was separated from a tracheostomy scar. Though cancellation of the surgery and tracheostomy was considered, we judged that bronchoscopic ablation was the most appropriate procedure because the area of the tracheal web in the airway was small. After we had obtained informed consent from her family, the web was removed by argon plasma coagulation (APC 300, ERBETOM ICC; Erbe Elektromedizin, Tuebingen, Germany) under flexible bronchoscopy (Fig. 1b). The tracheal web was removed within 10 min without any complications. The patient was subsequently intubated with a 7.0 mm endotracheal tube, and the planned surgery

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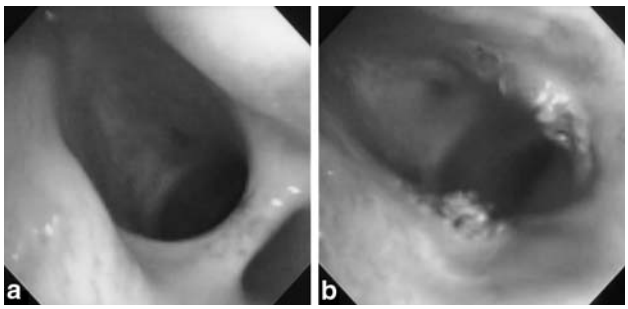

Fig. 1 **a** Bronchoscopic finding: a tracheal web exists below the vocal cords. **b** Bronchoscopic findings after ablation: the tracheal web was removed

proceeded without complications. After the operation, the endotracheal tube was extubated uneventfully. One week later, flexible bronchoscopy confirmed that there was no regrowth of the tracheal web. The patient had no respiratory complications during the rest of her hospital course.

Discussion

In adults, tracheal webs are known as a late complication after endotracheal intubation and after tracheostomy [1, 2], and are characterized as rare [3, 4]. Tracheal webs have been described in children at an incidence of 1 in 10 000 births [3, 4]. The incidence of tracheal webs in adults is unknown. It has been reported that 75% of laryngeal webs occur at the level of the vocal cords, with the remainder being subglottic or supraglottic [3].

The present case was also a complication of endotracheal intubation because the tracheal web was separated from a tracheostomy scar and endotracheal intubation had been possible 1 year previously. Common symptoms of tracheal webs are cough, stridor, and dyspnea on inspiration. Patients are often misdiagnosed as having asthma or chronic obstructive pulmonary disease [5]. However, such symptoms were not seen in this patient and so an evaluation of the airway was not performed before surgery. The area of the tracheal web in the airway was small in this patient, and while it caused no symptoms before surgery, a bridging form of granulation interfered with the endotracheal intubation.

According to the American Society of Anesthesiologists difficult airway algorithm [6], in a patient undergoing general anesthesia who cannot be tracheally intubated, but whose lungs can be ventilated via a mask, the laryngeal mask airway is an alternative to mask ventilation. In the present patient, a laryngeal mask airway was inserted because we needed to remove the tracheal web using a flexible bronchoscope. Bronchoscopic procedures such as ablation and web resection can be performed easily via a laryngeal mask airway [7, 8].

When a tracheal web is small, it can be removed by bronchoscopic ablation. If the area of the tracheal web is large, it may need tracheostomy or even cancellation of the planned surgery. We recommend that otolaryngologists or thoracic surgeons quickly judge whether they can treat the condition immediately if an unexpected tracheal web is found.

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